DESMODIUM LINDHEIMERI (LEGUMINOSAE) IN MEXICO AND TEXAS—When first described, *Desmodium lindheimeri* Vail (1891) was known from only four collections: three from Mexico and one from Texas. Since then, many more collections have been made, making it possible to draw conclusions about the range and habitat of this species.

Label data on the sheets in the University of Texas collection (LL, TEX), combined with the localities cited by Vail, indicate that the primary range of *D. lindheimeri* lies in Mexico in the states of Coahuila, Nuevo Leon, San Luis Potosi, and Tamaulipas (Fig. 1). *Desmodium lindheimeri* is usually found at an altitude of 1,000–2,000 m in Mexico. Of 27 Mexican collections in the University of Texas herbarium, only four were found below 1,000 meters. These were in Nuevo Leon at 985, 800, 600, and 450 meters. A majority of the collections were made in pine or oak forests and sometimes in a mixed pine/oak association. Plant associates include *Quercus muhlenbergii* Engelm., *Quercus gravesii* Sudw., *Quercus glaucoides* Mart. & Gal., *Colubrina greggii* Wats., *Ungnadia speciosa* Endl., *Acacia berlandieri* Benth., *Zanthoxylum fagara* (L.) Sarg., *Fraxinus cuspidata* Torr., *Ostrya virginiana* (Mill) K. Koch, *Acer grandidentatum* Nutt., *Carya ovata* (Mill) K. Koch, *Juglans major* (Torr.) Heller, and *Populus tremuloides* Michx. The bloom period is apparently from early August through October, possibly into November. Flower color is usually whitish to pale pink, though occasionally rose-pink to purple. The stems are up to 2 m long.

In contrast to the situation in Mexico, the passage of time has not produced numerous collections of *D. lindheimeri* from a similarly broad area in Texas. Until recently, this taxon had not been collected at all in Texas since Lindheimer's Comal County collection in November 1850. On March 12, 1992, the author found a population of *D. lindheimeri* in Comal County, Texas, distributed along the rocky bed of a dry ravine, here designated Locality 1 (precise locations of all Texas populations withheld). On October 15, 1995, populations were found at two other localities. Locality 1 lies on the midpoint of a line drawn between Locality 2 and Locality 3, which are 10 km apart. Distribution along this 10 km line, which crosses several separate ravine systems, is probably more or less continuous. The populations are at an altitude of about 270 m.

At Locality 1, the majority of plants are distributed along the rocky bed of a ravine with a few found among brush on the banks 0.3–1.3 m above the dry ravine bed. The author has walked a little over one kilometer of this ravine and found the plants scattered throughout, as well as along one-third kilometer of a side ravine. It is apparent that *D. lindheimeri* is a favorite of the local deer population, with about 80% of the plants suffering

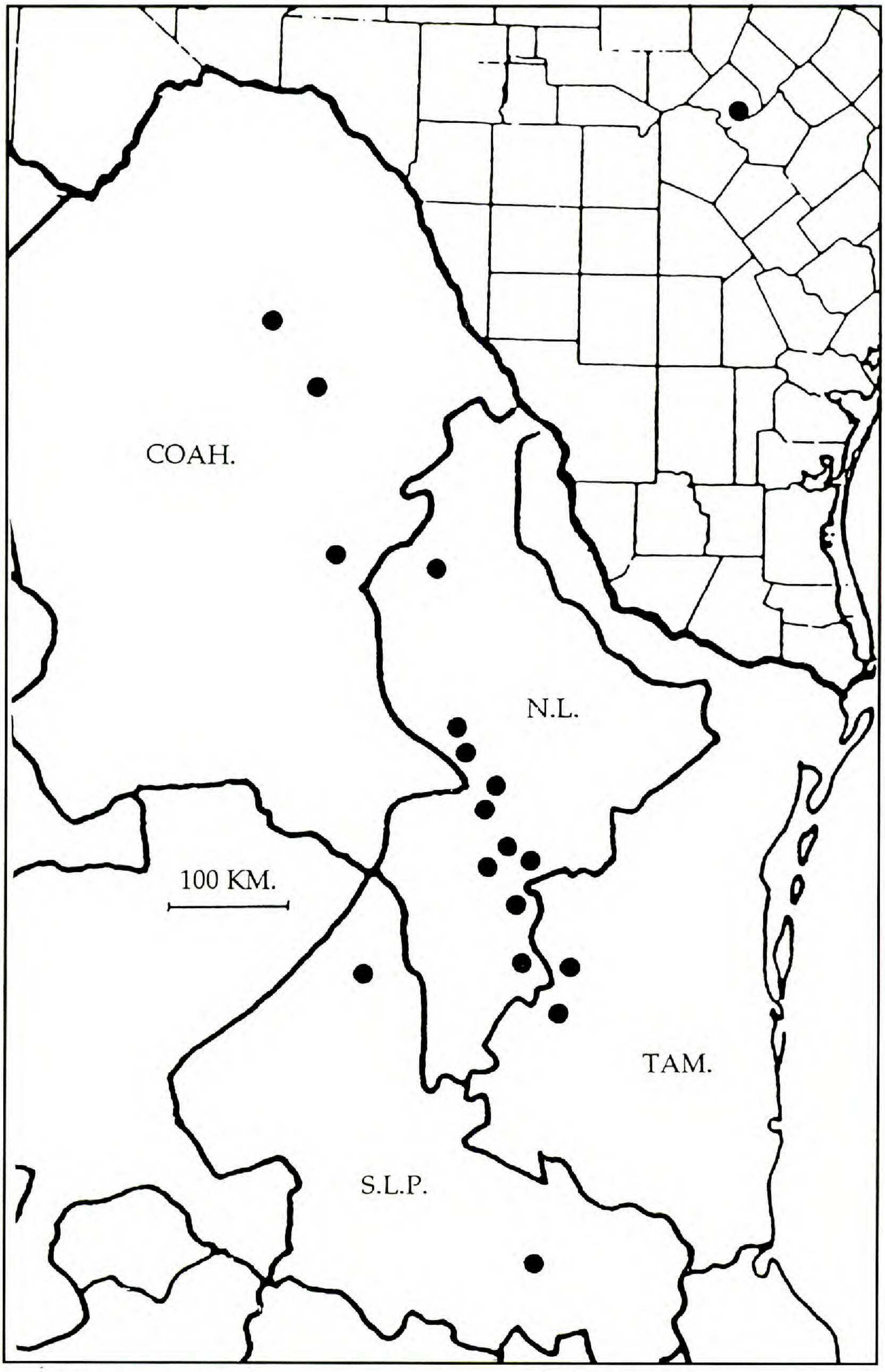

FIG. 1. Documented distribution of *Desmodium lindheimeri* Vail.

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browsing severe enough to prevent successful flowering and fruiting. At Locality 2, the plants occur on the very steep, tree-covered, 6–12 m high bank of a ravine but not in the bed of the ravine. At this site, the steep bank and uncertain footing combine to protect the plants from deer. Here, for 0.4 kilometer, about 90–95% of the plants are flowering and fruiting unmolested. At Locality 3, the plants are distributed in three clusters along the roadway for 200 m. They grow on flat ground in dry caliche, protected from the afternoon sun by the shade of the treeline. This right of way was probably colonized by plants from adjacent ravines. Whether due to nearby homes or a high volume of road traffic, the plants at this locality are almost untouched by deer and are producing an abundance of fruit. At all three sites, the plants range from 0.5 to 1.3 m tall, often with partially decumbent stems to 2 m long.

There does not appear to be anything remarkable about the habitat in which these Texas plants are found. It is a live oak/juniper association found throughout much of the Edwards Plateau consisting of *Quercus fusiformis* Small and *Juniperus ashei* Bucch. with *Quercus texana* Buckl., *Ungnadia speciosa* Endl., *Ulmus crassifolia* Nutt., *Croton fruticulosus* Torr., *Rhus toxicodendron* L., *Aloysia gratissima* (Gill. & Hook.) Troncoso, *Pavonia lasiopetala* Scheele, *Forestiera pubescens* Nutt., and *Bernardia myricifolia* (Scheele) Wats. In Texas, *D. lindheimeri* is abundant where found and seems to be a weedy, adaptable species which does well in a variety of habitats. It is surprising, then, to find it apparently restricted to a small area of Comal County.

Members of this genus are known by the common name "tickseed" because of the tenacity with which the hooked hairs of the loments attach themselves to clothing and animal hair, and, are well-known for ensuring seed dispersal through animal transport. Although it is possible that the Comal County material represents a disjunct relictual population (Nesom 1993), it is also possible that *D. lindheimeri* was one of the first plant invaders of Texas. Northeastern Mexico was the natural trading partner of the San Antonio region of Texas through the Eighteenth Century into the early Nineteenth Century. There was no shortage of candidates, animal or human, for seed transport.

In 1689, Alonzo de Leon, the governor of Coahuila, reached the general area of present day San Antonio (Williams 1979). Only two years later, in 1691, Don Domingo Teran de Los Rios left the main body of his expedition behind, and with four companions, visited the Comal Springs in what is present day Landa Park in New Braunfels. The Espinosa-Olivares-Aguirre Expedition, in 1709, discovered the San Pedro Springs and the San Antonio River and then passed through present day New Braunfels. The Domingo

Ramon Expedition, in May of 1716, camped at the site of present day New Braunfels.

While on a trading trip to Saltillo, Coahuila, a resident of San Antonio de Bexar wrote in a letter dated January 6, 1827, "To me there is nothing more agreeable than to wake in the morning, when among the mountains, and listen to the bleating of the calves and lambs, the lowing of the cows, the braying of the mules and donkies, and to behold the bakharas herding the cattle, the horses and mules, while on every cliff and rock, sheep and goats may be seen sporting from rock to rock, and leaping over every dangerous cliff. .... The exports of this country are wool, cochineal, and fruits; besides this a vast number of mules are driven into the States for sale." (Dewees 1852). Certainly, there were opportunities for seed dispersal from Mexico to Texas and colonization by *D. lindheimeri* prior to Lindheimer's collection of 1850.

The University of Texas collection of this taxon was greatly augmented several years ago when Dr. Guy Nesom reviewed the Mexican *Desmodium* and found numerous misidentified sheets of *D. lindheimeri.* These collections, combined with the recent Texas collections, make it possible to update and modify the description of the species.

Desmodium lindheimeri Vail, Bull. Torrey Bot. Club 18: 120. 1891.

Meibomia lindheimeri (Vail) Vail, Bull. Torrey Bot. Club 19:111. 1892.

Erect branching perennial herb 4–15(–18) dm tall; stem angulate, grooved, uncinulate-puberulent and -pubescent and sparsely scattered-pilose with slender white trichomes; stipules ovate, long-attenuate, densely pilose on the outer surface with long white trichomes, reflexed at maturity, not long persistent, 6.5–8 mm long, 1.5–2 mm wide; stipels slenderly lance-attenuate, 1.5–2 mm long; petioles densely uncinulate-puberulent and -pubescent and somewhat long spreading-pilose, 14–35(–45) mm long; leaf rachis similar, 6–15(–19) mm long; leaflets acute at apex, cuneate to obtuse at base, uncinulate-puberulent and more or less soft white-pilose above, densely long and soft white-pilose or tomentose below with prominent venation; terminal leaflet ovate to mostly rhombic in outline, 5–9(–10.5) cm long, 3–5.8(–7) cm wide; lateral leaflets more nearly ovate or elliptic, somewhat asymmetrical, 4.3–6(–7) cm long, 2–4 cm wide; inflorescence paniculate, the rachis ridged and grooved, uncinulate-puberulent and -pubescent; primary bracts ovate-attenuate, striate, long appressed pilose on outer surface, ciliate, glabrous within, not long persistent, 4.5–9 mm. long, 2–3 mm wide; secondary bracts essentially glabrous but ciliate, 0.8–3 mm long, 0.8–1 mm wide; pedicels rather finely pilose with multi-

cellular trichomes which are glandular at base; flowers pinkish-white to pale pink, occasionally rose-pink to purple; calyx finely puberulent, somewhat ciliate, the long white trichomes along central tooth of lower lobe reaching 3 mm in length; corolla to 7 mm long; loment stipitate, to 7-articulate; stipe 3–8 mm long; articles subrhombic to semiovate in outline, the isthmi slightly excentric, the articles appearing somewhat contorted because of the infolding of their margins, surfaces glabrous, reticulate at maturity, the suture densely uncinulate-puberulent, 7–11(–13) mm long, 5–8 mm wide; seeds 4–5(–6) mm long.

The relationship of this species is with *D. canescens* and its relatives, especially *D. ochroleucum* M.A. Curtis of southeastern United States, which it resembles particularly in the characters of the loments (Description adapted from Correll & Johnston 1970).

Specimens examined: MEXICO. **Coahuila**: Musquiz swamp, 15 Sep 1936, *E. G. Marsh, Jr. 917* (TEX); Musquiz Palm Canyon, 19 Sep 1936, *E.G. Marsh, Jr. 987* (TEX); Sierra de la Gloria, Canon El Cono, a side canyon of C. Chilipitin draining in from N near El Chilipitin, at lowest pouroff in steep-walled limestone canyon, 6 Sep 1976, *T. Wendt & D. Riskind 1610 & 1618* (TEX); Mpio. de Musquiz, In sheltered moist drainage of next spring WNW of "slump" spring, 24 Aug 1975, *T. Wendt, E. Lott, & D. Riskind 1313* (TEX). **Nuevo Leon**: Ejido Santa Rosa, Mpio. Iturbide, 29 Aug 1989, *A. Eduardo Estrada C. 1648* (TEX); Mountains near Monterrey, JUL 1933, *C.H. & M.T. Mueller 491* (TEX); Rio Ramos en el municipio de Allende, 17 Sep 1983, *A. Rodriguez, M.A. Carranza, & Grupo ICCAC 958* (TEX); Mpio. Villaldama, Sierra Gomas, in Canyon El Alamo on limestone talus, 15 Aug 1988, *T.F. Patterson 6757* (TEX); Galeana, Haciendo Pablillo, 26 Aug 1936, *M. Taylor 243 & 219* (TEX); Areas cercanas a Cola de Caballo, cercana a corrientes de agua, no date, *J.A. Villarreal, M.A. Carranza & M. Vasquez R. 2861* (TEX); Mpio. Linares, near Ejido Los Alamos, 7.2 mi S of Mex. 60, 28 Oct 1982, *J. Grimes with K. Nixon, L. Dorr, & S. Sundberg 2370* (TEX); Mpio. Iturbide, in a gully NW of Ejido Santa Rosa, 4.1 mi S of Iturbide, Loma la Banderra, 25 Oct 1982, *J. Grimes with K. Nixon, L. Dorr, & S. Sundberg 2334* (TEX); Iturbide to Camarones, 6 Sep 1991, *Hinton et al. 21392* (TEX); Mpio. de Montemorelos, La Trinidad, 19 Aug 1939, *C.H. Muller 2833* (TEX); Iturbide to Camarones, 17 Sep 1991, *Hinton et al. 21545* (TEX); N of Aramberri, 9 Sep 1990, *Hinton et al.* 20589 & 20556 (TEX); North of Mpio. Villa de Santiago, Canon la Boca, camino a Cola de Caballo-Laguna de Sanchez, 10 Sep 1983, *J.A. Villareal, M.A. Carranza, & M. Moreno 2360* (TEX); Mpio. Montemorelos, 5 km SE of La Trinidad, on eastern side of Sierra Cebolla, near Ojo de Agua, 7 Aug 1988, *T.F. Patterson 6278* (TEX); Monterrey, in canyon above El Diento, Oct 1961, *R. F. Smith M581* (TEX). **Tamaulipas**: Mpio. Hidalgo, road from Sta. Engracia toward Dulces Nombres, N.L., 0.3 road mi W of Paraje de Los Caballos, 11.4 road mi E of Dulces Nombres, 4.6 road mi from crossing of deep canyon of Arroyo Ramirez Luna, N-facing slope, 21 Sep 1994, *G. Nesom with M. Mayfield & J. Hinton 7462* (TEX); Hidalgo, Puerto Purificacion, 23 Sep 1994, *Hinton et al. 24837* (TEX); Hidalgo, Los Caballos, 21 Sep 1994, *Hinton et al. 24812* (TEX); 11 mi by road W of Victoria toward Jaumave, 29 Sep 1959, *M.C. Johnston & J. Graham 4120* (TEX).

U.S.A. **TEXAS: Comal Co.**: New Braunfels, NOV 1850, *F. Lindheimer 765a (= L. 499)* (LL); Locality 1, 12 Mar 1992, *M. Enquist 2089* (TEX), 19 Mar 1992, *M. Enquist 2116*

(ANSM, BRIT, GH, MEXU, MO, SRSC, TAES, TEX, UVST), 28 Oct 1994, *M. Enquist 2593* (ANSM, BRIT, GH, MEXU, MO, SRSC, TAES, TEX, UVST), cultivated in Texas Tech Greenhouse, material from Locality 1 in Comal County, 31 Oct 1994, *M. Enquist 2596* (BRIT, GH, MEXU, MO, TAES, TEX); Locality 2, 15 Oct 1995, *M. Enquist 2890* (ANSM, BRIT, GH, MEXU, MO, SRSC, TAES, TEX, UVST); Locality 3, 15 Oct 1995, *M. Enquist 2892* (BRIT, GH, MEXU, MO, TAES, TEX).

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